

CLAIMS

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1. An endoscope system comprising:
an endoscope having a solid-state imaging device whose sensitivity can be varied by applying a plurality of pulsating driving signals so as to change an electron multiplication rate;

a signal processing unit for processing a signal output from said solid-state imaging device;

a light source unit for irradiating light to an object so that an object image will be projected on said solid-state imaging device; and

a sensitivity control means for varying a sensitivity control pulse, applying it to said solid-state imaging device, and thus controlling the electron multiplication rate for said solid-state imaging device.

2. An endoscope system comprising:

an endoscope having a solid-state imaging device whose sensitivity can be varied by applying a plurality of pulsating driving signals so as to change an electron multiplication rate;

a signal processing unit for processing a signal output from said solid-state imaging device;

a light source unit for irradiating white light or special light of wavelengths falling within a specified wavelength band to an object with the intensity of light

varied;

a means for switching observation under the white light or observation in an ordinary light mode and observation under the special light of wavelengths falling within the specified wavelength band or observation in a special light mode; and

a sensitivity control means for varying a sensitivity control pulse, applying it to said solid-state imaging device, and thus controlling the electron multiplication rate for said solid-state imaging device.

3. An endoscope system comprising:

an endoscope having a solid-state imaging device whose sensitivity can be varied by applying a plurality of pulsating driving signals so as to change an electron multiplication rate;

a field-sequential light source unit for sequentially irradiating light to an object so that an object image will be projected on said solid-state imaging device;

a sensitivity control means for varying a sensitivity control pulse, applying it to said solid-state imaging device, and thus controlling the electron multiplication rate for said solid-state imaging device; and

a signal processing means including a signal pre-processing means for processing a signal output from said solid-state imaging device, a field-sequential signal

synchronizing means for synchronizing field-sequential signal components output from said signal pre-processing means, and a signal post-processing means for processing an output signal of said synchronizing means to produce a television signal.

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SUB A1
4. An endoscope system according to Claim 1 or 2, wherein said sensitivity control means is controlled based on any of a designation signal output from a designating means, an information signal fed from a connected endoscope and representing a feature of the endoscope, a movement information signal output from said light source unit, a signal representing a driving condition for said solid-state imaging device, and an output signal of said signal processing unit.

5. An endoscope system according to Claim 2, wherein said sensitivity control means extends control differently between observation in the ordinary light mode and observation in the special light mode.

SUB A2
6. An endoscope system according to Claim 1 or 2, wherein at least one of the number of pulses exhibited by a pulsating signal to be applied to said solid-state imaging device, and the waveform of the pulse is set for said sensitivity control means.

7. An endoscope system according to Claim 4, wherein the information representing a feature of a connected

endoscope is at least one of an f-number for the endoscope and the number of optical fibers constituting a light guide lying through the endoscope.

8. An endoscope system according to Claim 4, wherein the movement information concerning said light source unit is at least one of information based on an amount of light emitted from a lamp and information based on an iris diaphragm.

9. An endoscope system according to Claim 4, wherein the driving condition for said solid-state imaging device is at least one of information of an electronic shutter and information based on an imaging signal reading rate.

Sub B3 10. An endoscope system according to Claim 1 or 2, wherein the information representing a feature of a connected endoscope with which said sensitivity control means may be controlled is input at an input means.

11. An endoscope system according to Claim 1 or 2, wherein said signal processing means includes a means that when an output signal of said solid-state imaging device is lower than a set voltage level, amplifies a gain to be given to the signal.

12. An endoscope system according to Claim 1 or 2, wherein said sensitivity control means is included in said signal processing unit, and the sensitivity of said solid-state imaging device is set based on a type of endoscope or

a property of each solid-state imaging device.

13. An endoscope system according to Claim 1 or 2, wherein said light source unit includes a light level adjustment mechanism realized with an iris diaphragm.

14. An endoscope system according to Claim 2, wherein said light source unit field-sequentially irradiates light to an object, and an exposure time for observation in the special light mode is made longer than that for observation in the ordinary light mode.

15. An endoscope system according to Claim 2, wherein the observation in the special light mode is at least one of observation of auto-fluorescence, observation of fluorescence of a drug, observation of fluorescence induced with infrared light, and observation of reflected light of specified wavelengths.

16. An endoscope system according to Claim 2, wherein said light source unit emits light of wavelengths ranging from the ultraviolet spectrum to the blue spectrum for observation in the special light mode, and the light is at least one of light whose wavelengths fall within the ultraviolet spectrum, light whose wavelengths fall within the blue spectrum, light of specified wavelengths falling within the visible spectrum and exciting a drug used for photodynamic diagnosis, light of specified wavelengths ranging from the visible spectrum to the near-infrared

spectrum, and light whose wavelengths are specified ones falling within the near infrared spectrum and which causes fluorescence.

~~sub 17~~ 17. An endoscope system according to Claim 1 or 2, wherein said endoscope is of a field-sequential type.

18. An endoscope system according to Claim 2, wherein said endoscope has two solid-state imaging devices incorporated in the distal part thereof, one of the two solid-state imaging devices is a solid-state imaging device not having an electron multiplication function but picking up an image signal from ordinary light, and the other one thereof is a solid-state imaging device having the electron multiplication function and picking up an image signal from special light.

19. An endoscope system according to Claim 2, wherein said endoscope has two solid-state imaging devices incorporated in the distal part thereof, one of the two solid-state imaging devices is a solid-state imaging device for picking up an image signal from ordinary light, and the other one thereof is a solid-state imaging device for picking up an image signal from special light.

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